

EPA Issues Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas

Overview

The U.S. Environmental Protection Agency (EPA) released final guidance for quantifying the local air quality impacts of certain transportation projects and comparing them to the PM_{2.5} and PM₁₀ (PM) national ambient air quality standards (NAAQS). This guidance is to be used by state and local agencies to conduct quantitative “hot-spot analyses” for new or expanded highway or transit projects with significant increases in diesel traffic.

EPA originally released this guidance in December 2010,¹ and released revised guidance in November 2013 (EPA-420-B-13-053) to reflect California’s latest approved emissions model, EMFAC2011, and EPA’s 2012 PM NAAQS final rule. See EPA’s “PM Hot-spot Guidance Change Bulletin: November 2013” (EPA-420-B-13-056) for a complete list of changes made in this revised guidance; all other parts of the guidance are unchanged. EPA developed the November 2013 guidance in coordination with the Department of Transportation and, for the EMFAC2011 parts of the guidance, the California Air Resources Board.

Note that this guidance is limited to quantitative PM hot-spot analyses. EPA has developed separate guidance for using MOVES to estimate carbon monoxide emissions for transportation projects, including roadway intersections, highways, transit projects, parking lots and intermodal terminals.

The quantitative PM hot-spot guidance, Federal Register notice, CO project-level MOVES guidance, and related documents can be found on EPA’s Office of Transportation and Air Quality website at: www.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm.

¹ In developing the original 2010 guidance, EPA released a draft version of this guidance for public comment on May 26, 2010 with a closing date of July 19, 2010 (75 FR 29537-29538). EPA received 15 sets of comments on the draft guidance and considered these comments when developing the guidance.

Purpose of the Guidance

This guidance describes how to complete quantitative PM hot-spot analyses. A hot-spot analysis is an analysis of a transportation project's impact on future localized pollutant concentrations and a comparison of those concentrations to the relevant NAAQS. These analyses are required only for new or expanded highway or transit projects with significant increases in diesel traffic. While this guidance addresses quantitative PM hot-spot analyses for transportation conformity purposes, certain sections of this guidance may be applicable when completing air quality analyses for transportation projects for other purposes.

This guidance describes how to estimate project emissions using EPA's MOVES model, California's EMFAC model, and other methods. It also outlines how to apply air quality models (AERMOD and CAL3QHCR) for PM hot-spot analyses. Finally, the guidance includes additional resources that may assist state and local agencies in conducting quantitative PM hot-spot analyses.

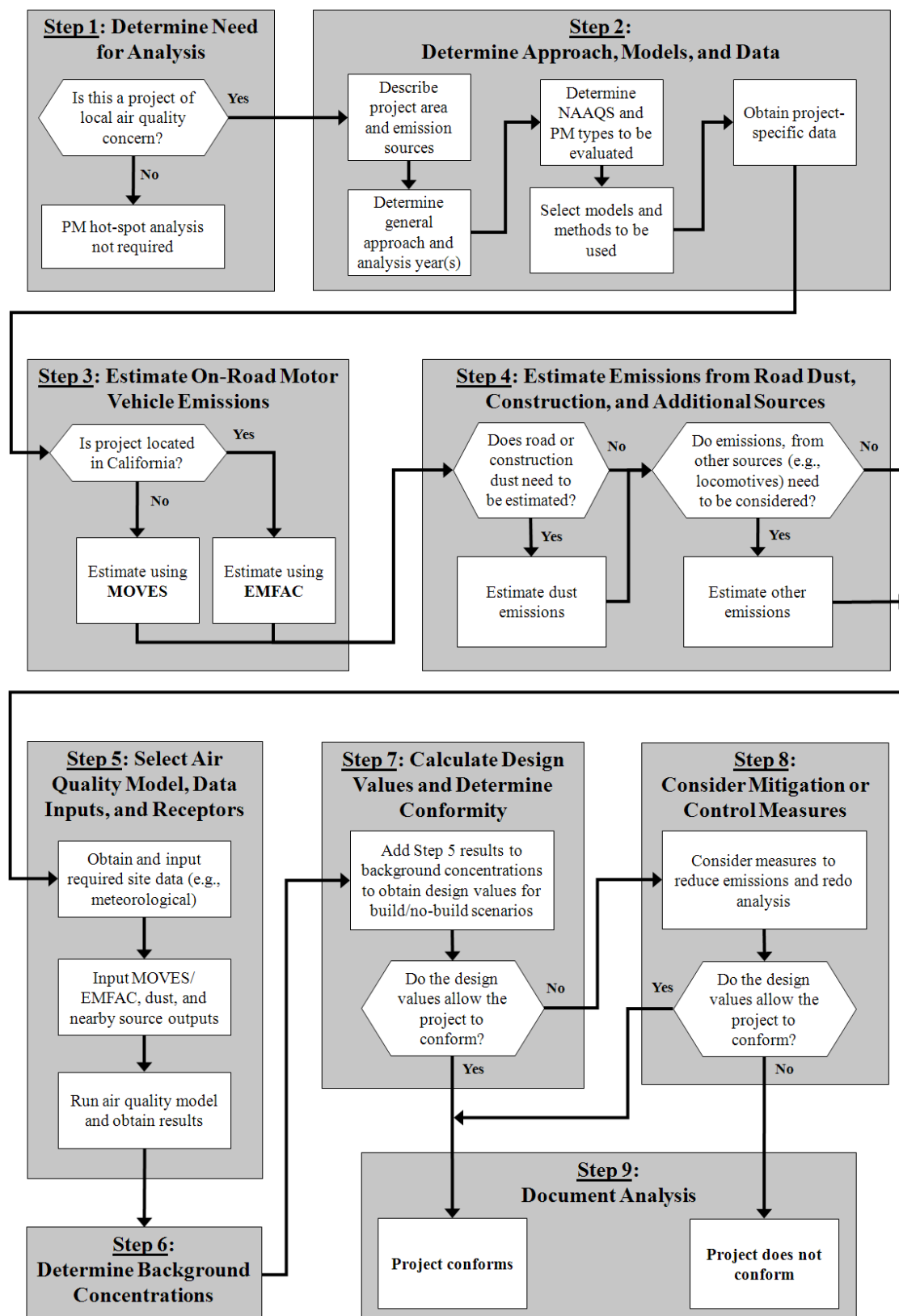
Background

Transportation conformity is a Clean Air Act requirement that ensures that federally supported highway and transit projects are consistent with state air quality implementation plans. Conformity helps protect public health through early consideration of the air quality impacts of transportation decisions in places where air quality does not currently meet the NAAQS or has not met them in the past.

Steps for Completing a Quantitative PM Hot-spot Analysis

The flowchart below illustrates the basic steps for completing a quantitative PM hot-spot analysis as described in the guidance. In general, a hot-spot analysis compares the air quality concentrations with the proposed project (the "build" scenario) to air quality concentrations without the project (the "no-build" scenario). For each scenario, it is necessary to consider emissions from the project and any nearby sources, as well as determine background concentrations. From this information, design values can be calculated to determine if a project conforms. If the build design values are less than or equal to the relevant NAAQS, the project is considered to conform. A project will also conform if the build scenario design values are greater than the NAAQS but less than or equal to the design values for the no-build scenario.

Overview of a Quantitative PM Hot-spot Analysis



Summary of Contents of Guidance

The following is a section-by-section description of the guidance:

Section 1: Introduction

This section provides general information about quantitative PM hot-spot analyses, including what they are and when they are required, and introduces the organization of the guidance. This section also includes contact information of EPA staff for questions regarding the guidance.

Section 2: Transportation Conformity Requirements

This section outlines the transportation conformity requirements for quantitative PM hot-spot analyses. This section also describes general statutory and regulatory requirements, specific analytical requirements, and the different types of agencies that are involved in developing hot-spot analyses.

Section 3: Overview of a Quantitative PM Hot-Spot Analysis

This section provides an overview of the process for conducting a quantitative PM hot-spot analysis. This section may be particularly helpful to those who are looking for a general understanding of this process. All individual elements or steps presented in this section are covered in more depth throughout the remainder of the guidance.

Section 4: Estimating Project-Level PM Emissions Using MOVES

This section describes how to use EPA's MOVES emissions model to estimate a project's exhaust, brake wear, and tire wear emissions for PM hot-spot analyses outside of California. This section focuses on determining appropriate project-level inputs and how MOVES should be run to provide the necessary information to complete air quality modeling.

Section 5: Estimating Project-Level PM Emissions Using EMFAC (in California)

This section describes how to use the EMFAC model to estimate a project's exhaust, brake wear, and tire wear emissions for PM hot-spot analyses in California. The California Air Resources Board (CARB) maintains EMFAC, which is approved by EPA for developing on-road motor vehicle emission inventories and conformity analyses in California.

Section 6: Estimating Emissions from Road Dust, Construction, and Additional Sources

This section describes how to estimate re-entrained road dust and transportation-related construction dust emissions, if dust is required to be included in the PM hot-spot analysis. This section also includes information on quantifying emissions from construction vehicles and equipment, locomotives, and additional sources of emissions in the area, when applicable.

Section 7: Selecting an Air Quality Model, Data Inputs, and Receptors

This section describes the recommended air quality models (AERMOD and CAL3QHCR), data inputs, and receptor considerations for PM hot-spot analyses. This guidance is consistent with the conformity rule and recommendations for air quality modeling in EPA's "Guideline on Air Quality Models" (Appendix W to 40 CFR Part 51).

Section 8: Determining Background Concentrations from Nearby and Other Emission Sources

This section describes how to determine background concentrations for PM hot-spot analyses, which can include nearby sources (sources other than the project that contribute to ambient concentrations in the project area) and other sources (background concentrations in the project area that are not from the project or any other nearby sources that are modeled).

Section 9: Calculating PM Design Values and Determining Conformity

This section describes how to combine all steps of a PM hot-spot analysis, as discussed in previous sections, into a design value so that a project sponsor can determine if conformity requirements are met. For conformity purposes, a design value is a statistic that describes a future air quality concentration in the project area that can be compared to a particular NAAQS.

Section 10: Mitigation and Control Measures

This section describes mitigation and control measures that could be considered by project sponsors to reduce emissions in the project area.

Appendices

The guidance also contains the following appendices to supplement the above sections and assist state and local agencies when conducting PM hot-spot analyses:

- Appendix A is a clearinghouse of information and resources external to this guidance that may be useful when completing PM hot-spot analyses.
- Appendix B gives examples of projects of local air quality concern.
- Appendix C discusses what projects in PM₁₀ areas need a hot-spot analysis if a state has a pre-2006 approved conformity SIP.
- Appendix D demonstrates how to characterize links in an intersection when running MOVES.
- Appendices E and F are abbreviated PM hot-spot analysis examples (using MOVES) for a highway and transit project, respectively.
- Appendices G and H are examples of how to configure and run EMFAC for a highway and transit project, respectively.
- Appendix I includes guidance for estimating locomotive emissions in the project area.
- Appendix J includes details on how to input air quality modeling data and run AERMOD and CAL3QHCR for a PM hot-spot analysis and prepare outputs for design value calculations.
- Appendix K has examples of how to calculate design values and determine transportation conformity.

For More Information

For specific questions concerning using this guidance for a project in a particular nonattainment or maintenance area, please contact the transportation conformity staff person responsible for your state at the appropriate EPA Regional Office. Contact information for EPA Regional Offices can be found at:

www.epa.gov/otaq/stateresources/transconf/contacts.htm.

General questions about this guidance can be directed to Meg Patulski at:

U.S. Environmental Protection Agency
Office of Transportation and Air Quality
Transportation and Regional Programs Division
(734) 214-4842
E-mail: patulski.meg@epa.gov

Technical questions about completing emissions and air quality modeling for CO and PM hot-spot analyses can also be sent to:

conformity-hotspot@epa.gov